JAE24USA

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of)
)
Luetjens)
)
Application No.: **09/775,675**)
)
Filed: February 2, 2001)
)
For: METHOD AND APPARATUS FOR OPTICAL DETECTION OF DEFORMATIONS, PARTICULARLY SMALL BUBBLES, IN OPTICAL DATA CARRIERS)

Examiner:

Group Art Unit:

CERTIFICATE UNDER 37 CFR 1.8(a)
I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail on the date indicated below in an envelope addressed to: Box Missing Parts, Commissioner for Patents Washington, DC 20231.

Signature _____

Date 4-17-01

Box Missing Parts
Commissioner for Patents
Washington, DC 20231

FIRST PRELIMINARY AMENDMENT

Sir:

Before calculating the filing fee, please amend the above-identified patent application as follows.

In the Claims:

Cancel the multiple dependent claims 3-14 and 17-32.

REMARKS

Please enter this preliminary amendment before calculating the filing fee. All of the multiple dependent claims have been canceled.

Please charge any deficiency or credit any overpayment to our deposit account no. 08-3040.

Respectfully submitted,
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SECOND PRELIMINARY AMENDMENT

Sir:

Please amend the above-identified patent application as follows.

The format of this Amendment complies with 37 CFR §1.121 "Manner of making amendments in applications" as amended on November 7, 2000 pursuant to the "Patent Business Goals Final Rule". Thus, according to 37 CFR §1.121(c)(i), the amended claims are provided in a form "without markings"; and according to 37 CFR §1.121(c)(ii), the amended claims are also provided, on a separate page, "marked up" to show the changes.

In the Title:

Replace the title "Method and Apparatus for Optical Detection of Deformations, Particularly Small Bubbles, in Optical Data Carriers" with the following new title provided on the verified English translation: --METHOD AND DEVICE FOR OPTICAL DETECTION OF LOCAL DEFORMATIONS, ESPECIALLY BUBBLES, IN AN OPTICAL DATA CARRIER--.

In the Specification:

Directly above paragraph 0001, replace the subheading "DESCRIPTION" with the subheading --FIELD OF THE INVENTION--.

Directly above paragraph 0002, insert the subheading --BACKGROUND OF THE INVENTION--.

Directly above paragraph 0004 insert the subheading --OBJECTS OF THE INVENTION--.

Directly above paragraph 0005 insert the subheading --SUMMARY OF THE INVENTION--.

Directly above paragraph 0023 insert the subheading --BRIEF DESCRIPTION OF THE DRAWINGS--.

Directly above paragraph 0024 insert the subheading --DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS AND METHODS--.

In the Claims:

Amend claims 1, 2, 15 and 16 as follows. [Format corresponding to 37 CFR §1.121(c)(i), ie. "without markings".]

1 (Amended). Method for optical recognition of defects, like local deformations (41) and bubbles, in an object, such as an optical data carrier (11), comprising the steps of:

illuminating the object with light by at least one source (12),

receiving the light (15) reflected by or transmitted through the object by at least one light-sensitive receiver (13), the light being reflected by or transmitted through the object at a normal angle of reflection (α) along a normal axis of reflection (15) for a defect-free object, and

varying at least one property of at least one part of the light in front of the light-sensitive receiver when the light is reflected by or transmitted through the object along an axis of reflection (24) shifted from the normal axis of reflection (15) and with an angle of reflection (α') shifted from the normal angle of reflection (α).

2 (Amended). Method according to claim 1, wherein the light incident on the light-sensitive receiver is varied by a selected one of the group consisting of altering the intensity of the light, altering the polarization of the light, filtering out at least one wavelength, and filtering out a range of wavelengths.

15 (Amended). Device for optical detection of defects, such as local deformations (41) or bubbles, in an object, such as an optical data carrier (11), comprising:

at least one light source that illuminates the object (11) with light,

at least one light-sensitive receiver (13) that receives the light reflected by or transmitted through the object, in which, for a defect-free object the light is reflected by or transmitted through the object at a normal angle of reflection (α) and along a normal axis of reflection (15), and

at least one optical means (29, 32, 34, 36, 37, 39) provided in front of the light-sensitive receiver (13), through which at least one of a property and intensity of the light incident on the light-sensitive receiver is varied when the reflected or transmitted light is incident on the optical means at an angle of incidence (α') shifted from a normal angle of incidence corresponding to the normal angle of reflection (α) and along an axis of incidence (26, 27) shifted from a normal axis of incidence (28) corresponding to the normal axis of reflection (15).

16 (Amended). Device according to claim 15, wherein the light-sensitive receiver has at least one linear, optically active sensor (19) and wherein the optical means (29, 32, 34, 36, 37, 39) causes a change in the incident light when the incident light is shifted in a direction perpendicular to the extent of the linear sensor (19).

Add new claims 33-62, as follows.

33 (New). A method according to claim 1, wherein a selected one of a property profile and an intensity profile of the incident light is produced above the light-sensitive receiver, wherein said profile has a selected one of a gradient (45), a local maximum, and a minimum when the light is reflected by or transmitted through the object (11) at the normal angle of reflection along the normal axis of reflection, and wherein said profile is shifted as a function of a shift of the reflected or transmitted light relative to the light-sensitive receiver.

34 (New). A method according to claim 33, wherein the profile is shifted instantly as a function of the shift of the reflected or transmitted light relative to the light-sensitive receiver.

35 (New). A method according to claim 2, wherein the intensity of the incident light is reduced when the angle of reflection and axis of reflection are shifted in a predetermined direction, and wherein the intensity of the incident light increases when the angle of reflection and axis of reflection are shifted in an opposite direction.

36 (New). A method according to claim 35, wherein a large part of the incident light is blocked when the angle of reflection and axis of reflection are shifted in said predetermined direction, and wherein a large part of the incident light is transmitted to the light-sensitive receiver when the angle of reflection and axis of reflection are shifted in said opposite direction.

37 (New). A method according to claim 2, wherein the intensity of the incident light is reduced when the angle of reflection and axis of reflection are shifted in any direction.

38 (New). A method according to claim 2, wherein the intensity of the incident light increases when the angle of reflection and axis of reflection are shifted in any direction.

39 (New). A method according claim 1, wherein the light-sensitive receiver has at least one linear, optically active sensor (19), and wherein said varying step causes a shift of the light incident on the linear sensor perpendicular to the extent of the linear sensor.

40 (New). A method according to claim 1, wherein the object is illuminated by at least one essentially parallel light beam (14).

41 (New). A method according to claim 40, wherein the light beam has a width (b1) incident on the object, wherein the light-sensitive receiver (19) has an optically active width (b2), and wherein said width (b1) of said light beam incident on the object is larger than said optically active width (b2) of the light-sensitive receiver (19).

42 (New). A method according to claim 1, wherein said light-sensitive receiver has an objective, and wherein the light reflected or transmitted by the object is focused in said objective of the light-sensitive receiver essentially independently of the angle of reflection and axis of reflection.

43 (New). A method according to claim 42, wherein said varying step occurs a spaced distance in front of said objective of said light sensitive receiver.

44 (New). A method according to claim 1, wherein the object is illuminated by means of a light strip and the reflected or transmitted light illuminates a linear, optically active sensor of the light-sensitive receiver, and wherein during said varying step at least one property of the incident light is readjusted over substantially the entire length of the linear sensor of the light-sensitive receiver.

45 (New). A device according to claim 16, wherein the optical means causes a continuous and substantially instantaneous change of the incident light as a function of a shift of the incident light in a direction perpendicular to the extent of the linear sensor (19).

46 (New). A device according to claims 15, wherein the optical means (36, 37, 39) has a transmission profile whose transmission varies as a function of at least one of an angle of incidence and an axis of incidence of the light on the optical means.

47 (New). A device according to claim 46, wherein the optical means (36) has a transmission profile, which, starting from the normal angle of incidence and normal axis of incidence, decreases in a predetermined direction when the light has at least one of a shifted angle of incidence and a shifted axis of incidence in said predetermined direction and increases in an opposite direction when the light has at least one of a shifted angle of incidence and a shifted axis of incidence in said opposite direction.

48 (New). A device according to claim 46, wherein the optical means (39, 37) has a transmission profile, which, starting from the normal angle of incidence and the normal axis of incidence, decreases when the light is incident on the light sensitive receiver at at least one of a shifted angle of incidence and a shifted axis of incidence.

49 (New). A device according to claim 46, wherein the optical means (39, 37) has a transmission profile, which, starting from the normal angle of incidence and the normal axis of incidence, increases when the light is incident on the light sensitive receiver at a shifted angle of incidence and a shifted axis of incidence.

50 (New). A device according to claim 15, wherein said optical means is a mask (29), which, starting from the normal axis of incidence and the normal angle of incidence, covers one side of the light-sensitive receiver so that light with at least one of an angle of incidence and an axis of incidence shifted in a predetermined direction is blocked, whereas light shifted in an opposite direction is transmitted.

51 (New). A device according to claim 15, wherein said optical means is a color filter, which, starting from a normal axis of incidence and a normal angle of incidence, covers one side of the light-sensitive receiver so that at least one wavelength is filtered out for light with at least one of a shifted angle of incidence and a shifted axis of incidence in a predetermined direction, whereas light shifted in an opposite direction is transmitted.

52 (New). A device according to claim 15, wherein said optical means is a polarization filter, which, starting from a normal axis of incidence and a normal angle of

incidence, covers one side of the light-sensitive receiver so that at least one wavelength is polarized for light with at least one of a shifted angle of incidence and a shifted axis of incidence in a predetermined direction, whereas light shifted in an opposite direction is transmitted.

53 (New). A device according to claim 16, wherein said optical means is a mask (29, 32, 34), and wherein said mask is positioned parallel to the linear sensor (19) of the light-sensitive receiver (13).

54 (New). A device according to claim 15, wherein said optical means (29, 32, 34) has at least one of a property profile and an intensity profile for the incident light with at least one of a gradient (45), a local maximum, and a minimum over the light-sensitive receiver when the light is reflected by or transmitted through the object (11) at the normal angle of reflection along the normal axis of reflection, and wherein said profile is changed as a function of a shift in at least one of an angle of incidence and an axis of incidence of the reflected or transmitted light relative to the light-sensitive receiver.

55 (New). A device according to claim 16, wherein said optical means is a slit mask (32) whose slit (33) is arranged parallel to the linear sensor (19) of the light-sensitive receiver.

56 (New). A device according to claim 16, wherein said optical means includes a linear mask (34) whose transparent strip (35) is aligned parallel to said linear sensor (19) of the light-sensitive receiver.

57 (New). A device according to claim 16, wherein said light-sensitive receiver has an objective, wherein said optical means (36) has a darkening tint in a direction perpendicular to the linear sensor of the light-sensitive receiver, and wherein said optical means extends at least partially over said objective of the light-sensitive receiver and said tint darkens from one side to the other side of the objective.

58 (New). A device according to claim 16, wherein said light-sensitive receiver has an objective, wherein said optical means (39, 37) has brightening tint in one direction and darkening tint in an opposite direction perpendicular to the linear sensor of the light-sensitive receiver, and wherein said optical means extends at least partially over the objective of the light-sensitive receiver and a line with a selected one of minimum tinting and maximum tinting is arranged above the linear sensor of the light-sensitive receiver.

59 (New). A device according to claim 16, wherein the light is an essentially parallel light beam.

60 (New). A device according to claim 16, wherein the light beam incident on the object has a width (b1), wherein the sensor of the light-sensitive receiver has an optically active width (b2), and wherein said width (b1) of the light beam incident on the object is larger than the optically active width (b2) of the sensor of the light-sensitive receiver.

61 (New). A device according to claim 15, wherein said light-sensitive receiver has an objective, and further comprising an optical lens arrangement (17) which is provided in front of the light-sensitive receiver and which focuses the incident light essentially

independently of the angle of incidence and the axis of incidence in the objective of the light-sensitive receiver, wherein the optical means is arranged between the optical lens arrangement and the objective to vary the properties of the incident light.

62 (New). A device according to claim 61, wherein a parallel light beam path (14, 15) is utilized to illuminate the object, and wherein a telecentric structure is prescribed in the light beam path (14,15).

Version of Amended Claims
with Markings to Show Changes Made
Corresponding to 37 CFR §1.121(c)(ii)

1 (Amended). Method for optical recognition of defects, like local deformations (41) [or] and bubbles, in an object, [especially] such as an optical data carrier (11), [in which method] comprising the steps of:

illuminating the object [is illuminated] with light by at least one source (12), [and]

receiving the light (15) reflected by or transmitted through the object [is received] by at least one light-sensitive receiver (13), [in which] the light [is] being reflected by or transmitted through the object at a normal angle of reflection (α) along a normal axis of reflection (15) for a defect-free object, [characterized by the fact that in front of the light-sensitive receiver,] and

varying at least one property of at least one part of the light [is varied] in front of the light-sensitive receiver when the light is reflected by or transmitted through the object along an axis of reflection (24) shifted from the normal axis of reflection (15) [and/or] and with an angle of reflection (α') shifted from the normal angle of reflection (α).

2 (Amended). Method according to claim 1, [characterized by the fact that] wherein the light incident on the light-sensitive receiver is varied by a selected one of the group consisting of [in] altering the intensity of the light, [and/or] altering the polarization of the light, [and/or] filtering out at least one wavelength, [or] and filtering out a range of wavelengths [wavelength range is filtered out].

15 (Amended). Device for optical detection of defects, [like] such as local deformations (41) or bubbles, in an object, [especially] such as an optical data carrier (11), [with] comprising:

at least one light source that illuminates the object (11) with light, [and with]

at least one light-sensitive receiver (13) that receives the light reflected by or transmitted through the object, in which, for a defect-free [data carrier] object the light is reflected by or transmitted through the object at a normal angle of reflection (α) [or] and along a normal axis of reflection (15), [characterized by the fact that] and

at least one optical means (29, 32, 34, 36, 37, 39) [is] provided in front of the light-sensitive receiver (13), through which at least part of the light incident on the light-sensitive receiver is varied in at least a selected one of its properties [and/or] and intensity when the reflected or transmitted light is incident on the optical means at an angle of incidence (α') shifted from [the] a normal angle of incidence corresponding to the normal angle of reflection (α) [and/or] and along an axis of incidence (26, 27) shifted from [the] a normal axis of incidence (28) corresponding to the normal axis of reflection (15).

16 (Amended). Device according to claim 15, [characterized by the fact that] wherein the light-sensitive receiver has at least one linear, optically active sensor (19) and [that] wherein the optical means (29, 32, 34, 36, 37, 39) causes a change in the incident light when [it] the incident light is shifted in a direction perpendicular to the extent of the linear sensor (19).

REMARKS

Multiple dependent claims 3-14 and 17-32 were canceled in a First Preliminary Amendment. This Second Preliminary Amendment adds new claims 33-62. Thus, claims 1, 2, 15, 16 and 33-62 are currently pending.

The preliminary amendments place the claims in better conformance with U.S. practice. For instance, multiple dependent claims and indefinite phrases such as "or" have been eliminated, where possible. Proper antecedent basis has been provided for claim elements, and proper grammar has been provided where the application translated awkwardly into the English language.

No new matter was added. The subject matter of new claims 33-62 are disclosed in canceled claims 3-14 and 17-32.

Please charge any deficiency or credit any overpayment to our deposit account no. 08-3040.

Respectfully submitted,
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